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Paper No. 7-19

Presentation Time: 8:30 AM-4:30 PM

EVERY PEBBLE COUNTS: A RECONSTRUCTION OF THE FLUVIAL HISTORY OF BLACKTAIL DEER CREEK

VAN WETTER, Eliza¹, FOKY, Trent², HINZMANN, Alice³, IOSSO, Chantal⁴, PHINNEY, April I.⁵ and PERSICO, Lyman P.², (1)Whitman College, Walla Walla, WA 99362; Geology, Whitman College, 280 Boyer Ave, Walla Walla, WA 99362, (2)Department of Geology, Whitman College, 345 Boyer Ave, Walla Walla, WA 99362, (3)Department of Geology, Carleton College, 300 North College Street, Northfield, MN 55057, (4)Department of Geology, Washington and Lee University, 204 W Washington Street, Lexington, VA 24450, (5)Department of Geology and Environmental Science, Wheaton College, 501 College Avenue, Wheaton, IL 60187

Blacktail Deer Creek drains the northern flank of the Washburn Range in Yellowstone National Park. The stream is confined to meltwater channels produced by the receding northern Yellowstone outlet glacier in the late Pleistocene. The stream is part of the relatively low elevation Northern Range where elk forage in the winter. The eradication and subsequent reintroduction of wolves has impacted the elk population and their grazing habits which has had larger impacts on the ecosystem as a whole. In order to understand these potential effects on the stream systems, we must have a baseline for the geomorphic conditions and reconstruct the history of the channels and surrounding valley floor. The character of the bed material in Blacktail Deer Creek is essential to our understanding of how dynamic the channel has been. The size of material determines how often sediment is mobilized and when the channels can incise. This summer, we characterized the bed material of the East and West Fork of Blacktail Deer Creek to determine if historic flood discharges were able to initiate bed transport and therefore, how much the stream could have incised. Preliminary results indicate that the D50 value of the East Fork averages 27cm while the West Fork averages 62cm. The D90 values of East Fork and West Fork are similar: 111cm and 153cm, respectively. The larger bed material is likely not mobilized during flooding events. Additionally, both the East Fork and West Fork show trends of increasing D50 values moving downstream but the D90 values do not show any trends in distribution for either fork. The presence of the large sediment in each fork reflects the inability of these streams to transport the glacial deposits of the Blacktail Deer Plateau. Relict till in the channels is the source of the large bed material and suggests minimal Holocene incision. Additionally, we have mapped the channel patterns from historic aerial photographs dating back to the 1950s. Both forks show relatively consistent channel shapes with the exception of a few avulsions. The stability of the channels and large D90 values suggests that Blacktail Deer Creek has undergone minimal historic incision. The Blacktail Deer Creek stream system is influenced not only by ecological factors, but also by the geomorphic history of the landscape.

Session No. 7--Booth# 55

[T17. Undergraduate Research II \(Posters\)](#)

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